Seattle Tune Up Accelerator Diagnostic Tool Packages

	Tune Up Assessment Elements	Diagnostic Approach	Diagnostic Tool Application(s)
1.	**Heating Ventilation, and Air Condition**		
a.	Review HVAC equipment schedules (Including daily, weekly, seasonal, day/night, occupied/unoccupied hours).	Record start/stop operation of supply fans, return fans, exhaust fans pumps, chillers, and boilers associated with HVAC equipment and compare to occupancy schedule(s)	Electric motor logger Electric contact logger Energy/Power logger
b.	Review HVAC set points (including space temperatures, supply air temperatures, CO2, boiler temperatures, chilled water temperatures, economizer changeover temperatures, and building pressure).	Measure operating condition(s) and compare to setpoint:	***Static Measurements:*** Vane Anemometer Thermal Anemometer Hand-held Infrared Thermometer Digital Psychrometer Digital Manometer ***Logging:*** Temp/Humidity/Light Logger 4-Channel Logger With Remote Sensors WIFI Temp/Humidity logger Carbon Dioxide meter with data logger Desktop IAQ logger Carbon Monoxide logger Differential pressure transmitter with data logger
c.	Review reset schedules (including supply air temperature, supply air pressure, boiler and chiller water temp, lockouts with outside air temp, loop differential pressure).	Measure operating condition(s) and compare to setpoint:	***Static Measurements:*** Thermal Anemometer Temp/humidity/CO2 meter Vane Anemometer Handheld IR thermometer

			Boiler/Chiller Temp. Reset: Temp/Humidity/Light Logger 4-Channel Logger With Remote Sensors WIFI Temp/Humidity logger ***Duct Pressure:*** Digital Manometer Differential Pressure Transmitter with Logger ***Hydronic Loop Differential Pressure:*** Digital Liquid Manometer Differential Pressure Transmitter with Logger
d.	Review optimal stop/start capabilities.	If optimum start/stop available document HVAC system start time verses occupancy schedule	***Equipment Start/Stop Logging***: Electric motor logger CONTACT logger ***Temperature Loggers:*** Temp/Humidity/Light Logger 4-Channel Logger With Remote Sensors WIFI-TH-HA Temp/Humidity logger
e.	Verify that HVAC sensors are functioning, calibrated, and in appropriate locations. Identify where sensors should be repaired, adjusted, calibrated, and/or moved.	Test and calibrate critical sensors: Outside air temperature, discharge air temperature, duct static pressure, mixed air temperature, return air temperature	***Static Measurement:*** Vane Anemometer Thermal Anemometer Hand-held Infrared Thermometer Digital Psychrometer Digital Manometer CO2 meter CO meter

f.	Verify HVAC controls are functioning as intended.	Functionally test HVAC equipment sequence of operation	***Static Measurement:*** Vane Anemometer Thermal Anemometer Hand-held Infrared Thermometer Digital Psychrometer Digital Manometer CO2 meter CO meter
g.	Review HVAC controls for unintended or inappropriate instances of simultaneous heating and cooling.	Verify lockout temperature on boilers and chillers. Verify discharge air reset controls.	***Static Measurement:*** Vane Anemometer Thermal Anemometer Hand-held Infrared Thermometer Digital Psychrometer Digital Manometer ***Logging:*** Temperature Loggers: Temp/Humidity/Light Logger 4-Channel Logger With Remote Sensors WIFI-TH-HA Temp/Humidity logger
h.	Note any indications of significant air-balancing issues (e.g. wind-tunnel effect).	Troubleshoot air balance/pressure issues	***Building Pressure Issues:*** Digital Manometer Diff. Pressure Transmitter with Logger ***Air Balance Issues:*** Al Flow Hood Thermal Anemometer Vane Anemometer
i.	Identify any indications that ventilation rates may vary significantly from ASHRAE 62.1 standards and be inappropriate for current facility	Measure outside air supply at minimum damper position.	Digital manometer Thermal anemometer Flow Hood

	requirements (e.g. no outside air supply or 100% outside air supply)		CO2 meter/logger CO meter/logger
j.	Identify Zones that are dominating multi-Zone system operations.	Identify interior zones with high cooling loads (i.e., greater than 5 watts/ft2). Log discharge air temperature to document cooling demand	***Static Measurement:*** Vane Anemometer Thermal Anemometer Hand-held Infrared Thermometer Digital Psychrometer Temperature data logger ***Logging:*** Temperature Loggers: Temp/Humidity/Light Logger 4-Channel Logger With Remote Sensors WIFI-TH-HA Temp/Humidity logger
2.	**Lighting**		
a.	Identify any areas where lighting levels appear to be significantly higher than Appropriate for the space use and occupant needs.	Spot check lighting levels	***Static Measurement:*** Light meter ***Logging:*** Light level logger
b.	Verify lighting sensors are working and located Appropriately for the current functioning of the building.	Spot check operation of occupancy daylighting sensors	Light/occupancy logger Lighting level logger
c.	Review lighting controls schedules and sequences.	Verify lighting control schedules match occupancy	Light/occupancy logger

3.	**Domestic Hot Water**		
a.	Review domestic hot water temperature set points.	Measure hot water temperature at tap	***Static Measurement:*** IR thermometer ***Logging:*** WIFI temp logger with remote sensor Temp logger with remote sensor
b.	Review circulation pump controls.	Determine stop/stop schedule and/or aquastat temperature setting	Motor Logger Contact logger Data logger with external temperature sensor
4.	**Water Usage**		
a.	In irrigated areas over 500 square feet, verify irrigation schedule are in place, and review schedules.	Compare schedule to best practice	
b.	Verify irrigation rain sensors are calibrated, functioning properly, and located appropriately to collect relevant moisture data to trigger the system operating system.	Measure and calibrate rain sensor	Electric multimeter
c.	Verify cooling tower conductivity meter used to control blow down is calibrated and functioning properly.	Measure cooling tower sump conductivity and compare to setpoint	Handheld conductivity/PH tester
d.	Review water feature schedules.	Verify pump operation schedule	Motor logger Contact logger